

REMARKS

This application has been amended in a manner that is believed to place it in condition for allowance at the time of the next Official Action.

Claims 1-14 are pending in the present application. Claim 1 has been amended to recite a composition consisting essentially of a resin constituent. Claims 8 and 11 have been rewritten in independent form. In doing so, claims 8 and 11 have been amended to incorporate all the recitations of the base claim and any intervening claims. Claims 8 and 11 were identified as being allowable in the outstanding Official Action. As claims 8 and 11 have been rewritten in independent form, applicants believe that claims 8 and 11 are now in condition for allowance. In addition, new claims 13 and 14 have been added. Support for new claims 13 and 14 may be found in original claims 8 and 11.

In the outstanding Official Action, claims 1, 2, 9, 10 and 12 were rejected under 35 USC §102(b) as allegedly being anticipated by GASMENA 5,703,178. Applicants believe that the present amendment obviates this rejection.

GASMENA is directed to a coating composition that must be prepared by combining an epoxy silane resin, an epoxy resin, a silicon intermediate, a silicone-modified polyether, an aminosilane, at least one organometallic catalyst, at least one organic solvent, water, and at least one filler. In particular, the Examiner's attention is respectfully directed to column 4,

line 64 to column 5, line 20, wherein GASMENA teaches that the use of a silicon-containing polyether is essential.

However, as the Examiner is aware, the present invention relates to an environmentally friendly, epoxy-resin-based anti-corrosive composition that may be used in paints. In preparing such a composition, components such as silicon-containing polyether are not incorporated into the claimed composition.

As noted above, claim 1 has been amended to recite the transitional phrase "consisting essentially of". As the Examiner is aware, the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristics" of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976).

Applicants believe that GASMENA fails to disclose or suggest the claimed invention. Applicants respectfully submit that silicon-containing polyether materially affects the basic and novel characteristics of the claimed invention (see page 1, line 1 to page 3, line 17). Indeed, the Examiner's attention is respectfully directed to the declaration attached with this amendment.

The declaration shows that when the silicon-containing polyether used by GASMENA is left out of the composition, a significantly improved gloss retention and a lower color

difference are achieved. Applicants believe that the declaration provides further evidence that GASMENA composition is distinct from that of the present invention. Indeed, as previously noted, the field of use for the GASMENA publication as opposed to the claimed composition is quite distinct. As a result, applicants believe that GASMENA fails to disclose or suggest the claimed invention.

Claims 3-5 were rejected under 35 USC §103(a) as allegedly being unpatentable over GASMENA in view of EKLUND et al. 6,180,726. Applicants believe the present amendment obviates this rejection.

Claims 3, 4, 6 and 7 were rejected under 35 USC §103(a) as allegedly being unpatentable over GASMENA in view of IWAMURA et al. 5,705,567. Applicants believe the present amendment obviates this rejection.

Applicants believe that EKLUND et al. and IWAMURA et al. both fail to remedy the deficiencies of GASMENA. Neither publication discloses nor suggests a composition that lacks a silicon-containing polyether. As a result, applicants believe that GASMENA, EKLUND et al., and IWAMURA et al., alone or in combination with each other, fail to anticipate or render obvious the claimed invention.

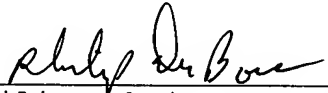
In view of the present amendment and the foregoing remarks, therefore, applicants believe that the present application is in condition for allowance at the time of the next

Official Action. Allowance and passage to issue on that basis are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON



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PD/lrs

**APPENDIX:**

The Appendix includes the following item:

- declaration by Mika Perälä



In re application of  
Mika Perälä et al.

Serial No. 10/019,962  
Filed July 4, 2000

Art Unit: 1712  
Examiner: Jeffrey B. Robertsson

## COMPOSITION TO BE USED IN PAINTS

### DECLARATION

I, Mika Perälä, Master of Science in Chemical Engineering, being employed from February 23, 1998 as a R&D Chemist in NOR-MAALI OY in Finland and being one of the inventors of the invention described and claimed in the subject patent application, depose and state the following facts with respect to the non-obviousness of the composition to be used in paints of the present invention as regards.

Comparative tests were carried out using paint formulation based on the patent of Gasmena with and without silicon containing polyether component (Kaneka) and the paint formulation made in accordance with present invention.

#### Paint formulation by Gasmena

A first part of a heat ablative coating composition was prepared by combining 2 grams(g) of the epoxy functional silane compound (Silquest A-187), 7,6 grams of xylene, 15 g of the epoxy resin (Erisys RF-50), 3,4 g of the siloxane (Dow Corning 3074), 3,6 g of the organotin compound (DBTL), and 0,3 g of the organozinc compound and mixing the ingredients together until uniform. To such first part ingredients were added 12 g clay filler, 0,8 g ethanol, 2,7 g glycol ether acetate, 13,3 g titanium dioxide pigment, 2,3 g black oxide pigment, 12 g talc filler, 18 g ceramic fiber filler, 0,9 g deionized water, 8,4 g xylene and 0,3 g thixotropic agent. The first part ingredients were mixed together at room temperature until uniform.

A second part of the heat ablative coating composition was prepared by combining 66 g silicon containing polyether (Kaneka), 0,6 g thixotropic agent, 5 g ceramic fiber filler, 16 g clay filler and mixing the ingredients together until uniform. To such second part ingredients were added 7,6 g xylene, 2,4 g aminosilane (Silquest A-1100); and 2,4 g amine catalyst (Ancamine K-54). The second part ingredients were mixed together at room temperature until uniform.

A heat ablative coating composition was prepared by combining the first and second part ingredients together and mixing the combined ingredients at room temperature until uniform.

#### Paint formulation by Gasmena without silicon containing polyether

A first part of a heat ablative coating composition was prepared similar way as described above.

A second part of a heat ablative coating composition was also prepared similar way but without silicon containing polyether (Kaneka). Amount of xylene was increased in the formulation to get the viscosity into the right level for application. Additional xylene was approximately 14,6 g.

A heat ablative coating composition was prepared by combining the first and second part ingredients together in stoichiometric ratio like in the example above and mixing the combined ingredients at room temperature until uniform.

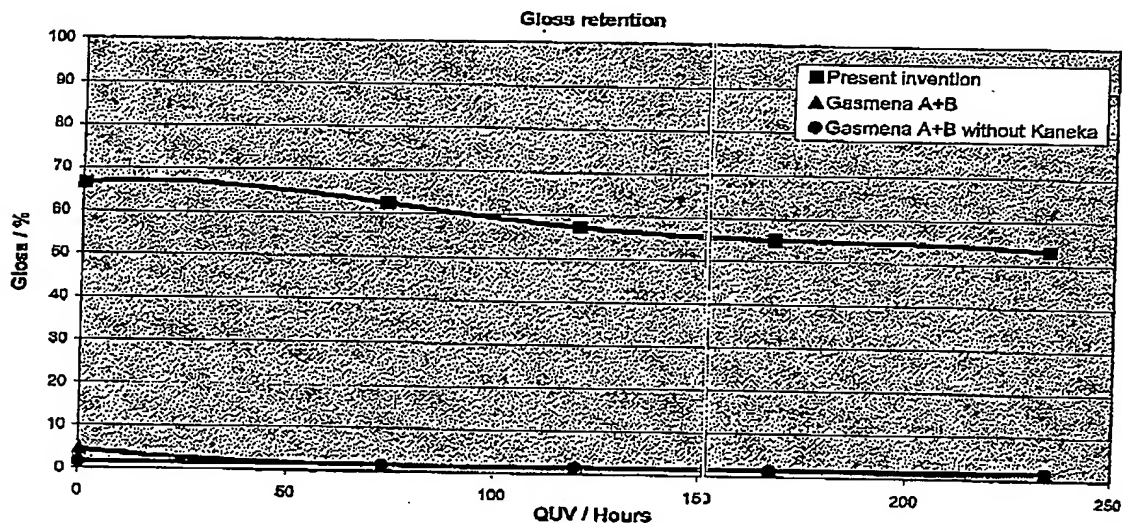
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**BEST AVAILABLE COPY**Paint formulation by present invention

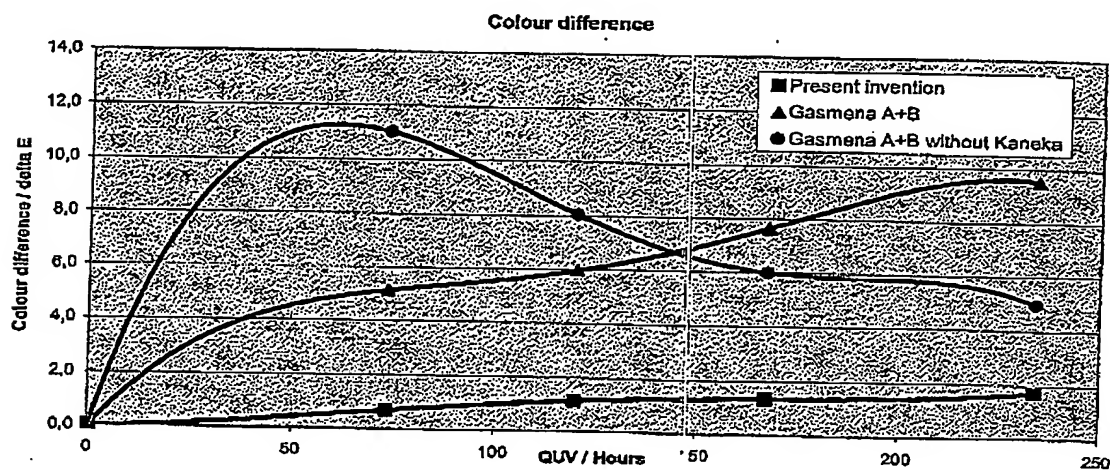
The polysiloxane paint was made in accordance with example 3 by present invention.

UV-resistance

Weathering test for the coatings by Gasmena and present invention was made with the QUV accelerated weathering tester according to standard ASTM G-53 (UVA 340 nm). Gloss retention and colour difference results are shown in the pictures 1 and 2.



Picture 1. Gloss retention of coating formulations by Gasmena and present invention.



Picture 2. Colour difference of coating formulations by Gasmena and present invention.

According to the results from weathering tests it can be seen that by taking out the silicon containing polyether from formulation there are still significant differences in the performance of the coating systems in question.

#### Composition differences of the paint formulations

Composition differences of the paint formulations by Gasmena and present invention are shown in the table I. Gasmena figures are taken from the patent and the figures of the present invention are calculated from example 3 with stoichiometric mixing ratio. The figures for Gasmena without silicon containing polyether are obtained by replacing polyether component with additional amount of xylene and then calculated from stoichiometric mixture.

**Table I:** Composition differences of the paint formulations by Gasmena and present invention.

	Epoxy functional silane	Siloxane	Epoxy	Polyether (Kaneka)
Gasmena (range)	0,5-5 %	0,5-5 %	1-20 %	20-45 %
Gasmena (preferred)	1 %	2 %	8 %	35 %
Gasmena (without Kaneka)	1,4 %	2,5 %	10,9 %	---
Present invention	4,4 %	27 %	23 %	---

Based on the results from table I it can be seen that ingredients similar to present invention (epoxy functional silane and siloxane) are at the level of additives in composition not part of a binder system.

In the present invention ingredients are non-aromatic epoxy resin, polysiloxane, epoxy functional silane and the hardener. By using the ingredients mentioned above as a binder system it is possible to manufacture and apply the paint without adding silicor. containing polyether. By this way it is possible to obtain high solids content paint with a very low VOC-level. The use of silicon containing polyether is not reasonable based on the weathering tests. Silicon containing polyether causes a rubber-like surface in the paint film which is not desirable due to its inability to tolerate scratches and mechanical stress.

The curing properties of the paint compositions were determined with the ball-type linear drying time recorder. The determination was made with non-pigmented laquers of Gasmena without silicon containing polyether and present invention to find out the actual curing rate of the binder systems. Results from the test are shown in the table II.

**Table II:** Drying times for the laquer versions of Gasmena without silicon containing polyether and present invention.

	Surface dry	Through dry	Hard dry
Gasmena (without Kaneka)	1,5 hours	3,5 hours	> 24 hours
Present invention	30 minutes	1,5 hours	4 hours

Even without silicon containing polyether the curing speed of Gasmena composition is considerably slower compared to the present invention.

The patents of Eklund and Iwamura represents different kind of technology one being powder coating application and other being stoving paint resin composition. Although similar type of resins mentioned and at some special cases used in those applications we do not see any relevance to the matter because of the totally different technologies.

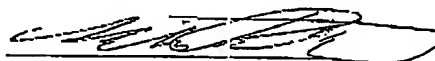


**BEST AVAILABLE COPY****Conclusion**

In the present invention ingredients are non-aromatic epoxy resin, polysiloxane, epoxy functional silane and the hardener. The coating composition according to the patent of Gasmena is based on the use of silicon containing polyether and resorcinol modified epoxy resin. The ingredients of the present invention are used for different purposes than the Gasmena composition. As stated in the Gasmena patent, epoxy functional silane acts as an adhesion promoter and siloxane is added to provide heat and fire resistance. While in the present invention polysiloxane and non-aromatic epoxy resin forms a binder system where the epoxy silane works as a crosslinker and siloxane compound is for better weatherability. Also when comparing the amounts of ingredients used in Gasmena, epoxy functional silane and siloxane compounds are at the level of additives and do not reflect levels that would be used in a binder system as in the present invention. Based on the results from the weathering test and drying time test one can see that leaving the polyether component out of the formulation does not mean that the paint composition by Gasmena renders obvious the present invention. Similar epoxy resins mentioned by Eklund and Iwamura are not relevant because of the different technologies used in the applications.

I further hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, both, under §1001 of Title 18 of the United States Code and that such wilful statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 21.01.2005

  
Mika Perälä